

Investigation No.: I.12-10-013
Exhibit No.: SCE-20



SOUTHERN CALIFORNIA
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(U 338-E)

***November 13, 2012, Letter from Edward Avella
to MHI Regarding Screening Criteria for
Acceptance of Steam Generator Permanent
Repair***

Before the
Public Utilities Commission of the State of California

San Francisco California
May 15, 2013



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SGR-L-M-MHI-111312124234

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November 13, 2012

SENT ELECTRONICALLY

Response Required YES

Dr. Hitoshi Kaguchi
Director, MHI Steam Generator Repair Site Team
Mitsubishi Nuclear Energy Systems, Inc.
c/o San Onofre Nuclear Generating Station
14300 Mesa Road (G55-SGR)
San Clemente, CA 92672

**San Onofre Nuclear Generating Station
Steam Generator Repair Project
Screening Criteria for Acceptance of Steam Generators Permanent Repair**

References:

1. Contract 4500024051
2. SCE Letter - SGR-L-M-MHI-110812131551 "Minimum Warranty Conditions for Repair"

Dr. Kaguchi:

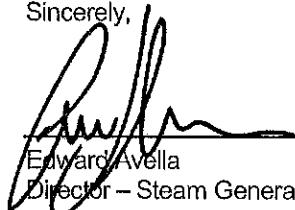
This letter delineates how Southern California Edison (SCE) will assess the acceptability of the warranty (permanent) repair options proposed by Mitsubishi Nuclear Energy Systems, Inc. (MHI) for the San Onofre Nuclear Generating Station (SONGS) steam generators (SG). SCE has requested a final proposal for a permanent repair by November 30, 2012. SCE has identified four assessment categories to ensure adequacy of a permanent repair: 1) effectiveness in meeting warranty conditions (ref. letter Warranty Repair Requirement for Steam Generators), 2) validation, 3) implementation, and 4) operational impacts.

SCE has developed criteria to assist in evaluation of the options (reference Attachment 1). Each criterion indicated by underlined text will be assessed as a "go/no go" condition. A "no go" assessment shall indicate that the specific criteria is not acceptable and thus the proposed repair is deemed not acceptable as a permanent repair. The remaining criteria will be individually assessed for degree of risk in acceptability as a permanent repair. Specific criteria for each category follow.

Using the criteria, SCE will evaluate the MHI proposal and provide feedback within fifteen (15) days of receipt of a comprehensive submittal. A repair found not acceptable as a permanent repair will be separately assessed for adequacy as an interim repair.

Please contact John Manso at (949) 368-2813, Mike Moran at (949) 368-2720, or me (949) 368-7534 should you have any questions regarding SCE's assessment method.

Sincerely,



Edward Avella
Director - Steam Generator Repair (SGR) Project

EA/ca

Attachment: Acceptance Criteria (4 pages)

cc: M.Moran (SCE), M.Anderson (SCE), D.Wood (SCE), J.Manso (SCE), Y.Kao (SCE), G.Ward (SCE),
J.Julien (SCE), SGR.Team@sce.com
H.Hirano (MHI), J.Hutter (MNES), T.Kanabushi (MHI)

A. Effectiveness	Option 1	Option 2	Option 3	Option 4
1. <u>Does the repair resolve thermal hydraulic conditions such that SONGS can operate at all power levels without undue tube vibration or unacceptable wear?</u>				
i. What is the impact on SG performance (pressure drop, flow velocities, etc.)?				
ii. Is the stability ratio less than 0.75?				
2. <u>Does the repair restore the design to ensure a thermal capacity of each SG of at least 1729 MWt?</u>				
i. What sustained power levels are acceptable for the proposed modification				
3. <u>Does the repair restore the full life of the SG components to forty years?</u>				
i. What is the expected operating life of the repaired SGs?				
ii. What is the basis for operating life?				
4. <u>Does the repair restore the tube plugging margin to less than 8% at end of life?</u>				
i. How does the repair address the existing degraded condition of the tubing?				
ii. How does the repair address the existing degraded condition of the AVBs, and how can that degradation be qualified?				
iii. If the existing AVBs are being adjusted in position so they would be on virgin tube material, how will MHI quantify the amount of damage to the AVB itself and its effect?				
iv. Is there a risk of loss of adequate out-of-plane and in-plane stability on any tubes?				
v. How does the repair address the presence of primary or secondary water inside those tubes removed from service (leakage via tube plugs or tube defects, or those already leaking)?				

B. Validation	Option 1	Option 2	Option 3	Option 4
1. <u>Have the repair and corresponding analyses been carried out successfully elsewhere within the nuclear industry (i.e., is it a first of a kind)?</u>				
i. How was the analysis model for flow elastic instability validated (i.e., through testing or comparison)?				
ii. What analysis or testing has been done to prove that the proposed repair will eliminate tube in-plane instability and tube-to-tube wear?				
iii. Were the wear calculations validated?				
a. What level of design review was performed?				
b. What is the expected wear rate at the new AVB and of the AVB material?				
c. What is the impact of the repair on existing tube-to-TSP and tube-to-AVB wear rates?				
d. If additional AVBs are being added, is there a negative impact on the existing AVB gaps and associated wear?				
e. How will the repair be monitored in the future to assure continued functionality and integrity?				
iv. Was the repair evaluated by full-scale or mock-up testing?				
v. Has an independent review of the repair method and associated analyses and calculations been conducted?				
vi. Will any special instrumentation be required to confirm that repair is effective?				
2. <u>Was the repair validated to be physically implementable within the SGs?</u>				
3. <u>For all repairs involving installation of new hardware, has the new hardware been evaluated itself for flow induced vibration, structural integrity, and position stability at SG design and operating conditions?</u>				
4. For new AVBs, does the repair address the true variability of the pitch changes that occur through the bundle due to both design incrementation and fabrication variances?				
5. Are non-destructive examinations (NDE) required or considered as a part of the repair process verification?				

C. Implementation	Option 1	Option 2	Option 3	Option 4
1. <u>Has the proposed repair been installed successfully elsewhere within the nuclear industry (i.e., is it a first of a kind)?</u>				
i. What special or new equipment, tooling, or techniques are required?				
ii. What special actions or equipment are required to ensure worker safety?				
iii. What are the special training requirements to install the repair?				
2. <u>Can the repair be done within the physical limitations of the SGs?</u>				
i. Are there any special spatial limitations or requirements?				
ii. Will any alterations to the SGs be needed?				
3. <u>Was full-scale testing of the repair conducted and deemed successful?</u>				
4. <u>Will the repair take an unacceptable amount of time to implement?</u>				
5. Have contingency plans, tools, and techniques been developed for restoring the SGs to pre-repair conditions (i.e., "back-out" criteria) should repair become impossible to complete?				
i. Are there any unrecoverable mishaps that could possibly occur?				
6. Is the repair adjustable following installation?				
7. Are there any habitability limitations (temperature, etc.) for personnel carrying out the repair (e.g., from working inside SG)?				
i. What is the dose or exposure estimate?				
ii. What actions are required for ALARA, such as special water levels for radiation protection?				
8. Are any special tools or techniques needed for repair?				
i. What special foreign material exclusion (FME) tools, techniques, or materials are required?				
ii. Is special handling equipment required?				
iii. Are there any special storage requirements?				
iv. Are there any special shipping requirements for components, tools, etc. needed?				
9. Will all tools, equipment or new components fit within the existing containment equipment hatch?				
10. Is the estimated waste generated for repair excessively high?				
11. Does the repair add any risk of loose-parts generation?				
i. If yes, how will risk be mitigated?				
12. Can and will the repair be implemented under a 50.59 process?				
i. What are the basis and impacts?				

D. Operational Impact	Option 1	Option 2	Option 3	Option 4
1. Will any special on-line monitoring of the SGs be required following the repair?				
2. Will any plant parameters need to be changed in conjunction with the repair, such as SG water level or feedwater and primary coolant temperatures?				
3. Will operation, surveillance, or other station procedures, programs, or engineering analyses (e.g., linear & non-linear vibration, seismic response, MSLB related reports, etc.) need to be modified due to the repair?				
4. Will any special training of plant personnel be necessary as a result of the repair?				
5. Will the new hardware be affected by future chemical cleaning, upper bundle flushing, normal chemical additions, or other maintenance activities?				
i. How has MHI demonstrated the materials are compatible with the SG primary and/or secondary chemistry and plant requirements?				
6. Will the repair cause future sludge accumulation or long-term tube fouling?				
7. Will future tube plugging and new repair hardware induce new thermally induced relative motions of tubes and AVBs and TSPs during plant heatup and cooldown and/or cause other design basis transients?				

Note: Are there any other conditions or issues that should be evaluated in addition to the above?